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Response to Office Action - 07/08/99

Application/Control No. 09/093,001

Claim 2, line 3, CANCEL “(“ after “spectrum” and INSERT “,” after “spectrum”

Claim 2, line 4, CANCEL the second “)” and INSERT “,” after “(EIS)”

Claim 2, line 12, CANCEL “potentiostat’s microcomputer” and SUBSTITUTE “microcomputer-controlled potentiostat”

Claim 2, line 13, INSERT “,” and which compares the low-frequency impedance with standard values or other measurements.” after “spectra”

Claim 2, lines 14-15, CANCEL “converting” and SUBSTITUTE “comparing” and INSERT “of the metallic structure to corrosion-inducing or coating-degrading conditions” after “exposure”

REMARKS

Claims 1 and 2 were rejected under 35 U.S.C. § 112, 2nd Para., as being indefinite for failing to particularly point out and distinctly claim the subject matter (Please see Page 3 of the Office Action, Item 3, Para. 1). Reconsideration of the rejection is hereby solicited.

You state that “the specification teaches achieving said accelerated exposure by immersion in salt water,” and that “the specification is unclear as to whether this immersion step is ceased during the step of measur[ing] the impedance.” The Davis *et al.* process teaches accelerated exposure only in Subpart (f) of Claim 1, and salt water is not mentioned in the claims of the Davis *et al.* process at all. Immersion in salt water was used as purely illustrative for the data of Figure 1. Furthermore, the sensor taught in the Davis *et al.* process could be used during the accelerated test or the test could be temporarily suspended for the measurement. Accelerated testing is not a requirement of the Davis *et al.* process -- measurements could just as easily be taken on ambiently exposed structures. Lastly, one of the advantages of the Davis *et al.* process is that identical measurements can be taken on a metal structure in the field or under service conditions and during and following exposure of the metal structure. Under these circumstances, accelerated exposure is not critical in the Davis *et al.* process, and thus, the claims should not be limited unnecessarily. Applicants are entitled to patent protection that is commensurate with their substantial contribution to the art.

With reference to the Office Action, Page 4, last Para.(Claim 1, lines 25-27) , the specification has been amended to include a revised drawing of Figure 2 (provided herein on separate paper) which includes a microcomputer-controlled potentiostat having an operational

program for correlating distinctive impedance signatures or distinctive impedance spectra (as referenced in Claim 2). The drawing describes the sensor, the potentiostat, and a green/yellow/red representation of the health of the structure based on the low frequency impedance and corresponding impedance ranges for the three condition levels. It is readily understood by those skilled in the art that a microcomputer is an integral and pre-existing component of a potentiostat. In addition, it is readily understood by those skilled in the art that the main function of a microcomputer-controlled potentiostat is to execute operational programs for correlating distinctive impedance signatures (Claim 1) or distinctive impedance spectra (Claim 2). Currently available potentiostats include an integral computer with an operating software to acquire and analyze EIS data. Such a potentiostat would interrogate the corrosion sensor. As such, it is not necessary to explicitly claim this matter. As an additional component of the potentiostat, applicants have designed and claimed a program to help interpret the data, which interoperates with the potentiostat's operating software. The claimed program compares the low-frequency impedance with standard values or other measurements to provide a good/bad/intermediate indication of the health of the structure or specimen being measured.

Claim 2 was rejected under 35 U.S.C. § 102 as being anticipated by Kihara *et al.* (U.S. No. 4, 806,849) (Please see Page 5, Item 5, Para. 1). Reconsideration of the rejection is hereby solicited.

Kihara *et al.* describes an apparatus in which a sponge-like material is pressed up against a coated metal and liquid electrolyte is forced throughout the sponge to contact the coated metal. In the Davis *et al.* apparatus, a liquid electrolyte is not critical, as such an electrolyte is untidy and can cause artifactual damage to a surface's coating. Under these circumstances, the claims should not be limited unnecessarily. In addition, Kihara *et al.* teaches dividing a structure into small areas in the form of a grid and mapping the coating health via impedance at selected frequencies and performing statistical analysis. In contrast, the Davis *et al.* apparatus does not direct formation of a grid and measurement taking. Instead, the Davis *et al.* apparatus teaches containing the detection area by controlling the wetness of the surface (See Claim 1(c)), and then utilizing comparative impedance spectra as an indicator of the structural integrity of the surface or specimen being utilized. Although Kihara *et al.* directs utilization of selected frequencies in the analysis process, the significant distinction between Davis *et al.* and Kihara *et al.* is that Davis *et al.* teaches that its electrodes can be used in the absence of electrolyte and do not require electrolyte immersion.

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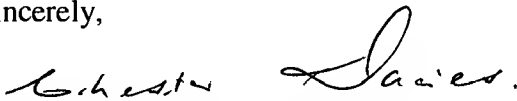
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Further, Kihara *et al.* approach uses a wet electrochemical cell without a bottom to perform EIS measurements in the field. The Davis *et al.* sensor is suitable for inspecting an actual structure. However, compared to the teachings of the Davis *et al.* sensor, Kihara *et al.* is messy (mandatory utilization of a liquid electrolyte), Kihara *et al.* is limited to flat, smooth surfaces that are easily accessible, and Kihara *et al.* can inspect only the small area that is wetted by the electrolyte. Additionally, the Kihara *et al.* electrolyte can cause chemical damage to a coating.

In view of the above, reconsideration and allowance of the pending claims are respectfully solicited.

Sincerely,

A handwritten signature in cursive script that reads "Chester Dacres".

Chester M. Dacres, Ph.D., P.E.
President